REPORT TO: **ECONOMIC DEVELOPMENT AND INFRASTRUCTURE SERVICES COMMITTEE ON 7 FEBRUARY 2023**

SUBJECT: **ENERGY CONSUMPTION ACTION OPTIONS AND DECARBONISATION OF CORPORATE BUILDINGS**

BY: **DEPUTE CHIEF EXECUTIVE (ECONOMY, ENVIRONMENT AND FINANCE)**

1. REASON FOR REPORT

1.1 To seek committee authority to progress with appropriate actions to reduce energy consumption in our Corporate Buildings in the short term and note longer term projects which will be developed and brought back to committee as appropriate.

1.2 To apprise Committee of the proposed methodology for phasing the decarbonisation of Moray Council Buildings, taking account of current financial resources and corporate priorities.

1.3 This report is submitted to Committee in terms of Section III (F) (33) of the Council's Scheme of Administration relating to the monitoring of the Council's Economic Development and Infrastructure Services.

2. RECOMMENDATION

2.1 It is recommended that Committee:

(i) approve the further reduction in the heat set point within our properties to 18 degrees which coincides with the school Easter break;

(ii) instruct officers to progress the development of spend to save energy proposals (LED lighting and Solar PV) which will be presented to future meetings of the Asset Management Working Group for approval, subject to payback period for each project;

(iii) notes the link between energy consumption, decarbonisation strategies and the ongoing development of a Heat in Buildings Strategy;

(iv) notes the financial challenges arising from the conversion of our property estate to non-carbon based heating systems and the proposed methodology for determining affordability and value for money in appraising options in the interim; and

(v) notes that officers will prepare detailed information to assist the budget setting process as outlined in paragraph 5.7.

3. BACKGROUND

3.1 There is a significant budget pressure in relation to future energy budget. The annual energy report in November 2022 indicated increase in consumption for financial year 2021/22 which resulted in increased costs. With increases in wholesale utility prices, significant increases in energy costs are anticipated for this financial year and next. Due to the way our energy is purchased, this year's increased costs have not been as marked as domestic increases due to our unit price being fixed at April 2022, with the overall increase circa 50%. Consequently future wholesale cost reductions may take longer to feed through to unit cost for the Council.

3.2

	2021/22 Actual Spend	2022/23 Projected Outturn	2023/24 Estimated Spend
Electricity	£ 2,209,147	£2,643,778	£4,044,980
Gas	£ 688,094	£1,783,450	£1,926,126
Biomass & Oil	£ 315,442	£ 447,234	£ 496,430
Total	£ 3,212,683	£4,874,462	£6,467,536

The above table shows the estimated cost for this financial year and the following financial year. It should be noted that this is an estimate based on 2021/22 consumption using the best available price information at time of writing. There will be further price guidance from Scottish Procurement in late January/February and the actual price will be confirmed in late March. The actual spend will potentially vary greatly depending on building use and performance, as well as the weather.

3.3 It is our understanding that the cost of energy will continue to rise until 2025 and remain high. The pre-2021 winter average was £50/MWh. Prices are expected to rise to £150/MWh in winter 2025 and will remain in excess of £100/MWh annually until 2030 and beyond.

4. REDUCING ENERGY CONSUMPTION

4.1 The costs of energy are directly linked to our consumption, although it should be noted that, as with domestic energy, we pay a standing charge which has

also increased significantly and is outwith our control. Energy consumption can be reduced either by the introduction of energy efficiency measures, behavioural changes and by closing or changing how buildings are occupied.

LED Lighting

4.2 The table below shows an example LED replacement project at Lhanbryde Primary School.

Lhanbryde Primary School LED Replacement Project			
Project Capital Cost	2023/24 Savings	Payback Period Years	Annual Kg CO2e Savings
£37,600	£5,269	5.7	4,688

4.3 The table above shows how a modest investment could provide some savings. This is a straightforward intervention which could be undertaken relatively quickly.

4.4 The costing above has been calculated by officers in conjunction with suppliers. However, the exact final cost would have to be determined following quotes from contractors or by competitive tendering.

4.5 It should be noted that fluorescent light fittings are being phased out by 2027 and therefore all fluorescent light fittings will need to be replaced over the coming years. If the costs of the above project are extrapolated out across the Learning Estate using a basic floor area calculation, the cost of LED replacement will be in the region of £2 million for the entire Learning Estate.

4.6 LED replacement in the council's office space potentially gives greater savings as, in general, the lights are operational for longer than in schools. Modern controls and sensors that detect occupancy will give more savings, especially given the increased transitory occupation of our office space.

4.7 The initial investigation and design work to replace the lighting in the corridors and stair wells of Council HQ has begun. As an example of the savings to be made in offices, lights in the HQ entrance hallway were changed in October 2022. The payback period for these is under two years.

4.8 External lights, there are opportunities for replacing external, car park and playing fields. For example, there are quotes being obtained for replacing the lights in the HQ Annexe car park. This is likely to cost around £5,500 and will have a payback period of around two years. Officers are assessing the external lighting across the estate to establish the scope of what will require replacing. In the meantime as opportunities arise projects will be considered individually and business cases conveyed to Asset Management Working Group.

Solar PV

4.9 There are opportunities to make revenue and carbon emissions savings by installing Solar PV on the roof tops of buildings. Officers have costed an

example of such a project for Bishopmill Primary School and it is detailed in the table below.

Bishopmill Primary School Solar PV Project			
Project Capital Cost	2023/24 Savings	Payback Period Years	Annual Kg CO2e Savings
£30,000	£5,277	5.7	5,600

4.10 We have received an estimate for roof top solar on the HQ building. At this stage, it does not contain some of the labour elements of the cost. It would likely cost a similar amount to that of the example of Bishopmill Primary School and deliver similar savings.

4.11 Solar PV projects of this size require permission from the Distribution Network Operator (DNO) which is SSEN in Moray. This is done through a G99 application, a process that can take three months. These kind of projects are likely to be approved as the system would be sized for the majority of the generated electricity which will be used on site, limiting the impact on the local grid. Solar PV projects do require more planning and time to execute than LED projects. As each building will have to be assessed individually to make sure they are suitable, an application to the DNO has to be made, and there are currently long lead times for parts and labour.

Mechanical Ventilation with Heat Recovery (MVHR)

4.12 Greenwards Primary School has struggled to maintain acceptable levels of air quality with CO2 levels recorded above the acceptable level. This was highlighted by the monitoring work introduced during the pandemic and has resulted in windows being opened to allow airflow, increasing gas consumption to heat the building. Installing MVHR would improve the internal learning environment, thermal comfort and air quality for the staff and students. The cost implication and energy savings of installing MVHR are detailed in the table below.

Greenwards Primary School MVHR Project			
Project Capital Cost	Potential 2023/24 Savings	Payback Period Years	Potential Annual Kg CO2e Savings
£200,000	£12,988	13.56	45,000

4.13 The above projects will provide improvements in consumption. However, to secure design, approval, procurement and then implementation this all takes time and will likely have minimal effect on 2023/24 budget. This projected savings would, however, be in place for financial year 2024/25 and there may be Scottish Government funding available to fund part of this type of intervention.

Valuation of Greenhouse Gas Emissions

4.14 Incorporating the value of carbon into the appraisal of projects can ensure proper account of greenhouse gas emissions, therefore putting a monetary value on the social and environmental benefits of a project that delivers a reduction in carbon emissions.

4.15 Using the example of MVHR in Greenwards Primary school, it can be shown how including this value can support the case for executing a project that would otherwise be rejected on a purely financial basis. This will allow a more thorough analysis of how a project can reduce financial costs and carbon emissions, otherwise projects which save money but not carbon will be ranked higher than projects which save both money and carbon. As per guidance from UK Government Department for Business, Energy & Industry Strategy (BEIS) the social costs of carbon should be monetised and included in appraisal and evaluation to ensure the impacts of carbon are taken into consideration.

4.16

Greenwards Primary School MVHR Project			
Project Capital Cost	Potential 2023/24 revenue Savings	Potential Annual CO2e Savings *	Payback Period Years
£200,000	£12,988	£11,160	8.2

* Potential annual co2e savings of 45,000 kg per annum monetised as per BEIS Valuation of greenhouse gas emissions: for policy appraisal and evaluation

5. IMMEDIATE INTERVENTION

5.1 The projects outlined in section 4 above will be progressed via the Council's spend to save procedure which will be progressed by officers via the Asset Management Working Group with the intention that savings will be generated from 1 April 2024. Updates on progress will be provided in the annual energy report.

5.2 A further immediate intervention could be to reduce the heat set point in corporate buildings from 19 degrees to 18 degrees, as this was a mitigation discussed at this Committee on 15 November 2022. Discussions in the Scottish Energy Officer's Network (SEON) have shown that sometimes a further reduction of the heat set point can be difficult to achieve with another Local Authority highlighting opposition from occupiers of buildings who had noted feeling cold. As discussed in November a comfortable temperature can be subjective. Due to the significant financial challenge, it is recommended that we progress to reduce the heat set point to 18 degrees. However, to mitigate the impact on building occupiers it is recommended that we introduce this measure after the School Easter Holidays as the ambient temperature heats up. This will permit building occupiers to become accustomed to the changed temperature prior to the winter period.

5.3 In order to deliver significant consumption reductions quickly, without incurring spend, there is the option to consider curtailing building opening. On that basis, the table below serves to provide an illustration of the potential savings temporarily closing the highest consuming corporate buildings could produce. The cost below are for consumption only and do not include standing charges. This information will inform budget considerations and the development of the Heat in Buildings Strategy, while efficient use of buildings is also a focus of the Smarter Working Project.

	Annual Consumption cost / Mothball Savings 2023/24 Prices.	Daily Closure Savings Winter	Daily Closure Savings Summer
Moray Council HQ	£ 121,024	£ 194	£ 140
Moray Council Annexe	£ 186,742	£ 73	£ 64
Elgin Library	£ 126,363	£ 142	£ 133
Ashgrove Offices	£ 32,457	£ 85	£ 43

Swimming Pools

5.4 Our highest consuming buildings include our swimming pools. The table below provides the annual consumption saving for the three pools which are separately metred assuming the properties were mothballed.

	Annual Consumption cost / Mothball Savings 2023/24 Energy prices
Buckie Swimming Pool	£ 148,370
Keith Swimming Pool	£ 126,528
Forres Swimming Pool	£ 119,573

5.5 The pools in Lossiemouth and Speyside High School are metered as part of the School. Therefore, it is harder to estimate the savings to be made by mothballing them. The consumption costs for Lossiemouth are in the region of £52,000 and Speyside £48,000.

5.6 It may not be cost effective to close swimming pools for short periods. As the water temperature would have to be maintained, or if allowed to cool, savings may be negated by the energy needed to re-heat the water back up to temperature. For this reason and for the way their energy is metered, it is difficult to quantify any energy saving to be made by closing for short periods on pool open days.

5.7 It should be noted that the above has only taken into account the savings to be made from energy consumption. Further any decisions on considering curtailing building openings will only be progressed in consultation with the smarter working project. Officers from Housing and Property will work with other Services during the budget setting process in order to assist in developing any potential savings proposals for consideration by Committee to ensure full property cost information will be available.

5.8 Behavioural change is as important as ever to make staff, students and service users aware of the challenges we face, both financially and in relation to carbon emissions. We will engage with the lead officers and services for our highest consuming buildings via the Energy and Climate Change teams. In particular, officers will engage with the climate change champions within schools to drive innovation and behaviours which will assist with reduction in our consumption.

5.9 Officers are in the process of developing a Heat in Building Strategy which will provide support to decision makers to ensure that proposals to use and develop our buildings complies with the Council's objectives and ensures the most efficient use of our properties and their heating systems. This strategy will be reported as part of the annual energy report. The strategy will align with the Local Heat and Energy Efficiency Strategy (LHEES). The council is required to submit a LHEES by the end of 2023. A LHEES officer has started with the council in January 2023 to begin working on this strategy.

6. DECARBONISING THE BUILDING STOCK

6.1 With the Council's net-zero target of 2030 and the Scottish Government target for all public buildings to be decarbonised by 2038, there are major works required, including replacement of carbon based heating systems. Of our 56 Schools, 26 are heated with gas systems, 18 by oil, 2 by biomass and the remainder being heated by inefficient electric systems. A similar situation can be found in the remainder of the building stock. In order to meet the respective targets, all of these heating systems would require to be replaced by low or zero carbon heat sources between now and 2030 or 2038, or for emissions to be offset where applicable. These heat sources will be either individual air source heat pumps (ASHP), ground source heat pumps (GSHP), connection to heat networks and possibly biomass.

6.2 As it stands, it is not financially viable to replace gas boilers of the size required for larger public buildings with heat pumps. The example in the table below shows the cost implications of simply replacing the gas boiler with ASHP in Bishopmill Primary.

Bishopmill Primary School Air Source Heat Pump Project				
Project Capital Cost	Annual Savings	Payback Period Years	IRR	Annual Kg CO2e Savings
£961,500.00	-£12,440	NA	Negative	86,000

6.3 This demonstrates part of the predicament faced on the route to net zero. Many of the boilers within our estate have reached the end of their designed life. To replace a boiler with a new like for like system will typically be the most practicable and cost effective option. However, ultimately this would not be optimal in terms of the Council's net-zero ambitions and lifecycle cost would have to be considered in terms of further upgrading being required before the end of their useful life. It is anticipated that new technologies will be developed in the years leading to 2030 which may strike the optimal balance

between installation cost, efficiency of operation and carbon emissions and each decision in the interim will be subject to an options appraisal to determine value for money for the Council.

Fabric First

6.4 The majority of the building stock is not suitable for fitting ASHP as a single heat source. The heat provided by this type of system is low level heat. This requires an efficient building envelope to be effective. The Scottish Government recommends as best practice to approach buildings with a 'Fabric First' approach, meaning that building's condition and fabric should be upgraded before considering low-carbon heat and renewable generation. Upgrading building fabric not only makes the building suitable for low carbon heat sources, fabric improvements make significant energy savings and a reduction in operational CO2 in the meantime.

6.5 A Fabric First approach should be the guiding principle within financial and affordability parameters, doing so will make the building more suitable for low carbon heat sources, allow time for technology to improve and reduce in price, allow time for heat networks to develop and potential grant funding that may come from central government. Most fabric improvements will, however, not give the demonstrable return on investment or payback periods offered by the LED and PV projects.

6.6 The route to retrofitting a building to becoming net-zero by 2030 could be demonstrated using Greenwards Primary School as an example.

Year	Measure	Benefits	Approximate Cost
1 - 2	Undertake mechanical ventilation project	Improved pupil work environment reduction in consumption.	£200,000
1 - 2	LED lighting Replacement.	Improved environment for pupils and reduction in consumption.	£38,000
2 - 5	Roof replacement with improved insulation	Extends life of roof/building fabric and reduces energy consumption.	£800,000
2 - 5	Externally insulate walls.	Extends life of walls/building fabric and reduces energy consumption	£200,000
4 - 7	Replace heating with low-carbon alternative.	Replaces carbon heat source for net zero objects but at a time when the building is as energy efficient as possible.	£900,000

6.7 Due to the challenges of funding the above, it is recommended that Committee note that initial interventions will be progressed based on spend to save options. However, it is recognised that to undertake the improvement in the fabric of our buildings and decarbonisation of our property estate that further capital funding will be required. It is proposed that officers develop business cases for the decarbonisation of our highest energy using buildings

first, that the focus for these business cases must be on reducing consumption first via spend to save projects where applicable and then establishing the most economically viable option to improve the building fabric and then replace the heat source with a non-carbon heat source if financially viable.

6.8 The methodology for assessing the financial viability of any works will first undertake an assessment to establish if the works generate a saving. If so, then the payback period will be established in pure financial terms and also taking account of the social costs of carbon of any reduction in CO^2. If a payback period of less than 15 years is established, the project will be taken to the Asset Management Working Group for assessment and decision making. When there is no financial benefit in terms of running cost reduction or the payback period is longer than 15 years, then capital investment will be required without a payback. The proposal will be assessed on a full life cycle approach taking account of the net zero objectives of the Council and future costs of carbon emissions.

6.9 Notwithstanding the above, there may be occasions where there is a failure of heating system which has exceeded their designed life time. If these fail in critical operational buildings such as schools, there may be a requirement to replace them before it is possible to upgrade the building's fabric. On those occasions to ensure continued service delivery, a like for like replacement may be required.

7. FINANCE / FUNDING

7.1 There is some external support available from the Non Domestic Energy Efficiency Framework (NDEE). There is a support Unit in the form of consultation delivered by Mott Macdonald and funded by the Scottish Government up to £50K. The support unit offer project management, technical and procurement support to deliver projects. The framework allows projects to be procured with Energy Performance Contracts (EnPCs) meaning that 25% of the fee is withheld until the project demonstrates its intended energy performance. This support is available until March 2024.

7.2 There are interest free loans available via SALIX. As part of the Scottish Green Public Sector Estate Decarbonisation Scheme Salix will continue to offer funding to eligible public bodies in Scotland via the existing Scottish Public Sector Energy Efficiency Loan Scheme.

7.3 This loan scheme offers zero interest loans to the public sector to enable them to undertake spend to save retrofit energy efficiency improvement projects to help them towards achieving net zero carbon in their estates. The available funding allows Salix to offer up to 75% of the total compliant project value along with increased payback criteria (subject to technical review and due diligence).

7.4 Salix is currently accepting applications to set up new Recycling Funds with Scottish local authorities and universities, dedicated to estate-wide energy

efficiency retrofits, in support of Scottish Government's carbon reduction target. Salix have been working with the public sector in Scotland since 2006. The Salix Recycling Fund aims to increase long-term investment in energy efficient technologies across the public sector. It is a ring-fenced fund held by the local authority, created with capital provided by Scottish Government through Salix, and equally matched by the local authority. Current Recycling Fund sizes vary from £100,000 to £1.6 million. The Salix contribution is a long-term 100% interest-free repayable grant. Scottish local authorities can use their former Central Energy Efficiency Fund (CEEF) or their own capital as their match contribution. The financial savings achieved by the projects are reinvested in further eligible projects year on year, hence the term 'Recycling Fund'. The Recycling Fund can also be used to finance retrofit programmes from the Non Domestic Energy Efficiency Framework (NDEE).

8. SUMMARY OF IMPLICATIONS

(a) Corporate Plan and 10 Year Plan (Local Outcomes Improvement Plan) (LOIP)

The Council's Corporate Plan 2019 – 2024 identifies the environment as a key principle in the delivery of the Council's priorities.

"Environment – look after the world we live in to protect it for the future" and for Moray Council to be "A resource efficient, carbon neutral council that works with partners to mitigate the worst effects of Climate Change, to create a resilient, fair and more sustainable future for everyone within Moray".

On 10 March 2021 (paragraph 13 of minute refers) the council adopted the Climate Change Strategy. The strategy set a goal of the Council being carbon neutral by 2030. On 6 April 2022 (paragraph 18 of minute refers), the Route Map to Net Zero was approved. This creates a framework for our actions aimed at reducing carbon emissions to net zero by 2030.

This report highlights some of the operational and financial challenges faced in order to reach this target.

(b) Policy and Legal

In October 2021 the Scottish Government published The Heat in Buildings Strategy. This sets a requirement for all local authorities to produce a Local Heat and Energy Efficiency Strategy (LHEES) by the end of 2023.

(c) Financial Implications

In 2021/22 the Council's total utility bill amounted to £3,696,136, an increase of £543,809 (17%) compared to 2020/21.

Unit electricity costs have increased by 20% and gas costs have increased by 157% from 2021/22 to 2022/23. With 2022/23 actual spend to end of August and current cost is applied to energy consumption of

2021/22, the projected annual costs of electricity and gas in 2022/23 will be £2,643,778 and £1,783,450 and respectively.

The Energy spend for the year 2023/24 will potentially be in excess of £6M. Energy prices will not fall back down to prices seen before 2021.

(d) Risk Implications

Budget guidance issued in June 2021 by Scottish Procurement indicates that in 2023-24 electricity unit costs are forecast to increase by 53% and gas unit costs by 8%, whilst in 2024-25 electricity will increase by 79% and gas by 79% - compared to 2022-23. However, energy markets remain volatile, there is a significant risk that future prices may change dramatically.

(e) Staffing Implications

The workload associated with transforming the Council's property portfolio to net zero carbon is expected to increase year on year.

(f) Property

The property implications are as set out in this report.

(g) Equalities

There are no equalities implications.

(h) Climate Change and Biodiversity Impacts

Updating the EPS to reflect the Councils goals to achieve net zero and the developing LHEES strategy will assist in setting out strategic cohesion in achieving reductions in climate emissions.

(i) Consultations

The Head of Housing and Property Services, the Chief Financial Officer, the Head of Economic Growth and Development Services, the Design and Construction Manager, the Principal Climate Change Officer, the Principal Building Services Engineer, the Legal Services Manager, the Equal Opportunities Officer, the Programme Manager (Learning Estate) and Lissa Rowan, Committee Services Officer have been consulted and any comments incorporated in this report as appropriate.

9. CONCLUSIONS

9.1 There are further potential savings to be made with a further reduction in the heating set points. However, the return may be diminished slightly when compared to the initial reduction and implementation may prove more difficult.

9.2 The greatest financial energy savings in the short to medium term can be achieved with LED lighting and Solar PV projects.

9.3 Reaching Net Zero is financially and operationally challenging. The way forward needs to be carefully planned and in conjunction with LHEES,

maintenance, service provision needs and the rationalisation of the council's corporate building stock and the way in which we use buildings post pandemic.

9.4 Officers will ensure that building energy consumption data is available for the development of budget proposals during the budget setting process.

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